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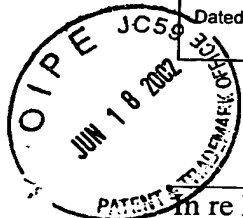
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Dated: June 18, 2002

Signature Linda A. Bourg
(Linda A. Bourg)

GP/1642

Docket No.: HO-P02080US1
(PATENT)



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Seiichi P. Matsuda, et al.

Application No.: 10/041,018

Group Art Unit: N/A

Filed: January 7, 2002

Examiner: Not Yet Assigned

For: DITERPENE-PRODUCING UNICELLULAR
ORGANISM

INFORMATION DISCLOSURE STATEMENT (IDS)

Commissioner for Patents
Washington, DC 20231

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Dear Sir:

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Pursuant to 37 CFR 1.56, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits as far as is known to the undersigned.

A copy of the references listed on the attached Form PTO/SB/08 is attached hereto.

A concise explanation of relevance of the items listed on form PTO/SB/08 is:

☒ not given

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[] in the form of an English language copy of a Search Report from a foreign patent office, issued in a counterpart application, which refers to the relevant portions of the references

While the information and references disclosed in this Information Disclosure Statement may be "material" pursuant to 37 CFR 1.56, it is not intended to constitute an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

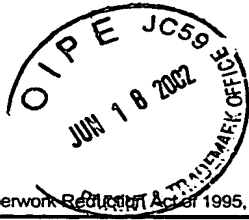
In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed references.

The Commissioner is hereby authorized to charge any fees necessary in the filing of this document to our Deposit Account No. 06-2375, under Order No. HO-P02080US1. A duplicate copy of this paper is enclosed.

Dated: June 18, 2002

Respectfully submitted,

By Elizabeth A. Hart
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PTO/SB/08A (10-01)

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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)			Complete if Known		
			Application Number	10/041,018	
			Filing Date	January 7, 2002	
			First Named Inventor	Seiichi P. Matsuda	
			Art Unit	1642	
			Examiner Name	Not Yet Assigned	
Sheet	1	of	3	Attorney Docket Number	HO-P02080US1

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	AA	4,849,410- /	07-18-1989	R. Jacobs et al.	
	AB	5,151,352- /	09-29-1992	H. Nakano et al.	
	AC	5,189,187- /	02-23-1993	H. Nakano et al.	
	AD	5,429,939- /	07-04-1995	N. Misawa et al.	
	AE	5,473,057- /	12-05-1995	W. Fenical et al.	
	AF	5,589,581- /	12-31-1996	N. Misawa et al.	
	AG	5,602,184- /	02-11-1997	C. Myers	
	AH	5,637,484- /	06-10-1997	Y. Yukimune et al.	
	AI	5,968,789- /	10-19-1999	Y. Yukimune et al.	
	AJ	6,235,287 B1- /	05-22-2001	M. Weidner et al.	
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		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				

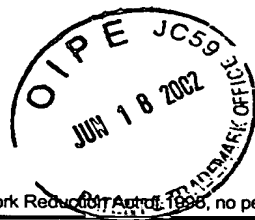
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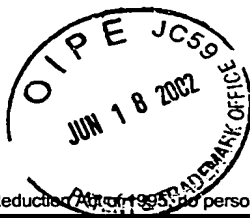
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				First Named Inventor	Seiichi P. Matsuda
				Group Art Unit	1642
				Examiner Name	Not Yet Assigned
Sheet	2	of	3	Attorney Docket Number	HO-P02080US1

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS				
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²	
	CA	ALBRECHT, M. ET AL., Synthesis of atypical cyclic and acyclic hydroxy carotenoids in <i>Escherichia coli</i> transformants. <i>J Biotechnol.</i> 1997 Dec 3;58(3):177-85.		
/	CB	BAILEY, J.E. (1991) Toward a Science of Metabolic Engineering. <i>Science</i> 252: 1668-1675.		
/	CC	BASSON, M.E. ET AL. (1987) Identifying mutations in duplicated functions in <i>Saccharomyces cerevisiae</i> : recessive mutations in HMG-CoA reductase genes. <i>Genetics</i> 117: 645-655.		
/	CD	BASSON, M.E. (1986) <i>Saccharomyces cerevisiae</i> contains two functional genes encoding 3-hydroxy-3-methylglutaryl-coenzyme A reductase. <i>Proc. Natl. Acad. Sci. USA</i> 83: 5563-67.		
/	CE	COREY E. J. ET AL. (1993) Isolation of an <i>Arabidopsis thaliana</i> gene encoding cycloartenol synthase by functional expression in a yeast mutant lacking lanosterol synthase by the use of a chromatographic screen. <i>Proc Natl Acad Sci USA.</i> , 90(24):11628-32.		
/	CF	CROWLEY, J.H., ET AL., A mutation in a purported regulatory gene affects control of sterol uptake in <i>Saccharomyces cerevisiae</i> . <i>J Bacteriol.</i> 1998 Aug;180(16):4177-83.		
/	CG	FUNK, C. ET AL. (1994) <i>Arch. Biochem. Biophys.</i> 308: 258-66.		
/	CH	HARA, M. ET AL. (1989) <i>J. Antibiotics</i> 42:1768-1774.		
/	CI	HEZARI, M. ET AL., Purification and characterization of taxa-4(5),11(12)-diene synthase from Pacific yew (<i>Taxus brevifolia</i>) that catalyzes the first committed step of taxol biosynthesis. <i>Arch Biochem Biophys.</i> 1995 Oct 1;322(2):437-44.		
/	CJ	JIANG, Y. ET AL., BTS1 encodes a geranylgeranyl diphosphate synthase in <i>Saccharomyces cerevisiae</i> . (1995) <i>J. Biol. Chem.</i> 270 (37): 21793-21799.		
/	CK	KAJIWARA, S. ET AL., Expression of an exogenous isopentenyl diphosphate isomerase gene enhances isoprenoid biosynthesis in <i>Escherichia coli</i> . <i>Biochem J.</i> 1997 Jun 1;324 (Pt 2):421-6.		
/	CL	KHOLODENKO, B.N., ET AL., Metabolic design: how to engineer a living cell to desired metabolite concentrations and fluxes. <i>Biotechnol Bioeng</i> 1998 Jul 20: 59(2):239-247.		
/	CM	LAFFEVER, R.E., ET AL., Diterpenoid resin acid biosynthesis in conifers: enzymatic cyclization of geranylgeranyl pyrophosphate to abietadiene, the precursor of abietic acid, <i>Arch Biochem Biophys.</i> 1994 Aug 15;313(1):139-49		
/	CN	LEAK, F.W. ET AL., In yeast, <i>upc2-1</i> confers a decrease in tolerance to LiCl and NaCl, which can be suppressed by the p-type ATPase encoded by <i>ENA2</i> . (1999) <i>DNA Cell Biol.</i> 18(2): 133-139.		
/	CO	LEARNED, R.M. ET AL., 3-Hydroxy-3-methylglutaryl-coenzyme A reductase from <i>Arabidopsis thaliana</i> is structurally distinct from the yeast and animal enzymes, <i>Proc Natl Acad Sci U S A.</i> 1989 Apr;86(8):2779-83.		
/	CP	LEWIS T.L. ET AL., Pleiotropic mutations in <i>Saccharomyces cerevisiae</i> affecting sterol uptake and metabolism. (1988) <i>Yeast</i> 4(2):93-106.		
/	CQ	LIU, S.-J. ET AL., A novel genetically engineered pathway for synthesis of poly (hydroxyalkanoic acids) in <i>Escherichia coli</i> . (2000) <i>Appl. Env. Microbiol.</i> 66(2): 739-743.		
/	CR	MISAWA, N. ET AL., Metabolic engineering for the production of carotenoids in non-carotenogenic bacteria and yeasts. <i>J Biotechnol.</i> 1997 Jan 3;59(3):169-81.		
/	CS	MISAWA, N. ET AL., Expression of a tomato cDNA coding for phytoene synthase in <i>Escherichia coli</i> , phytoene formation in vivo and in vitro, and functional analysis of the various truncated gene products. <i>J Biochem (Tokyo).</i> 1994 Nov;116(5):980-5.		
/	CT	MISAWA, N. ET AL., Production of beta-carotene in <i>Zymomonas mobilis</i> and <i>Agrobacterium tumefaciens</i> by introduction of the biosynthesis genes from <i>Erwinia uredovora</i> . <i>Appl Environ</i>		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/041,018		
		Filing Date	January 7, 2002		
		First Named Inventor	Seiichi P. Matsuda		
		Group Art Unit	1642		
		Examiner Name	Not Yet Assigned		
Sheet	3	of	3	Attorney Docket Number	HO-P02080US1

		Microbiol. 1991 Jun;57(6):1847-9.	
	CU	MISAWA, N. ET AL., Production of beta-carotene in Zymomonas mobilis and Agrobacterium tumefaciens by introduction of the biosynthesis genes from Erwinia uredovora. Appl Environ Microbiol. 1991 Jun;57(6):1847-9.	
✓	CV	MIURA, Y. ET AL., Production of lycopene by the food yeast, Candida utilis that does not naturally synthesize carotenoid. Biotechnol Bioeng. 1998 Apr 20-May 5;58(2-3):306-8.	
	CW	MIURA, Y. ET AL., Production of the carotenoids lycopene, beta-carotene, and astaxanthin in the food yeast Candida utilis. Appl Environ Microbiol. 1998 Apr;64(4):1226-9.	
✓	CX	NESS F. ET AL., SUT1 is a putative Zn[II]2Cys6-transcription factor whose upregulation enhances both sterol uptake and synthesis in aerobically growing Saccharomyces cerevisiae cells. Eur J Biochem 2001 Mar;268(6):1585-95	
✓	CY	PARKS, L.W. ET AL., Physiological implications of sterol biosynthesis in yeast. (1995)Annu. Rev. Microbiol. 49:95-116.	
✓	CZ	PARKS, L.W. ET AL., Biochemical and physiological effects of sterol alterations in yeast-a review. (1995) Lipids 30(3): 227-230.	
✓	CA1	PETERS, R.J., ET AL., Abietadiene synthase from grand fir (Abies grandis): characterization and mechanism of action of the "pseudomature" recombinant enzyme. Biochemistry. 2000 Dec 19;39(50):15592-602.	
✓	CB1	POLAKOWSKI, T.ET AL. (1998) Appl. Microbiol. Biotechnol. 49: 66-71.	
✓	CC1	RAVN, M.M., ET AL., Stereochemistry of the cyclization-rearrangement of (+)-copalyl diphosphate to (-)-abietadiene catalyzed by recombinant abietadiene synthase from Abies grandis. Org Lett. 2000 Mar 9;2(5):573-6	
✓	CD1	SHIMADA, H. ET AL., Increased carotenoid production by the food yeast Candida utilis through metabolic engineering of the isoprenoid pathway. Appl Environ Microbiol. 1998 Jul;64(7):2676-80	
✓	CE1	STEPHANOPOLOUS, G. (2000) Bioinformatics and Metabolic Engineering. Metabol. Eng. 2(3): 157-158.	
✓	CF1	STOFER VOGEL, B. ET AL., Abietadiene synthase from grand fir (Abies grandis). cDNA isolation, characterization, and bacterial expression of a bifunctional diterpene cyclase involved in resin acid biosynthesis. J Biol Chem. 1996 Sep 20;271(38):23262-8.	
✓	CG1	TRAPP, S.C. ET AL., Genomic organization of plant terpene synthases and molecular evolutionary implications. Genetics. 2001 Jun;158(2):811-832	
✓	CH1	WANG, C.-W. ET AL., Engineered isoprenoid pathway enhances astaxanthin production in Escherichia coli. (1999) Biotech. Bioeng. 62(2): 235-241.	
✓	CI1	WILDUNG, M.R. ET AL., A cDNA clone for taxadiene synthase, the diterpene cyclase that catalyzes the committed step of taxol biosynthesis. J. Biol Chem. 1996 Apr 19;271(16):9201-4.	
✓	CJ1	YAMANO, S. ET AL., Metabolic engineering for production of beta-carotene and lycopene in Saccharomyces cerevisiae. Biosci Biotechnol Biochem. 1994 Jun;58(6):1112-4	
	CK1		

Examiner Signature	Date Considered
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